



MICRONIX PC/104

DIGITAL IN-/OUTPUT BOARD

PV-1648

64 CHANNEL DIGITAL I/O

16 DIGITAL INPUTS

48 DIGITAL OUTPUTS

User Manual
&
Installation Guide

VERS. 1.04

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DESCRIPTION

Micronix PV-1648 lets you handle combined I/O from one single PC/104 board. The PV-1648 module plugs into any standard PC/- 104 bus interface and provides you with 16 digital opto-isolated inputs and 48 NPN non-isolated open collector digital outputs (optional pull-up to +5V). Non-Stack-through or stack-through (S-versions) connectors are available. Supplied with drivers for Windows 95/98 and NT.

FEATURES AND SPECIFICATIONS

Inputs

- Number of channels: 16 opto-isolated inputs, groups of two
- Isolation: Up to 1000 Vrms
- Mix voltage range: $\pm 30V$
- Current Limit Resistor: $10K\Omega$, 0.25W
- Logic "1" $U_{in} < -10V, U_{in} > +10V$
- Logic "0" $-5V < U_{in} < +5V$
- Input delay: ON: $< 25 \mu s$
OFF: $< 100 \mu s$
- Interrupts: Int. 5,9,10,11,15 selectable on channel 0
- Connector: 26-pin ribbon cable connector
- Power requirement: +5V DC, 50mA

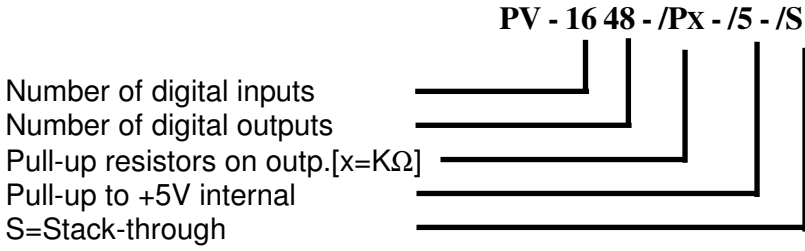
Outputs

- Number of channels: 48 non-isolated o.c. (optional pull-up), one common GND, 4 groups of 12 bits
- Voltage, load: 50V DC
- Max current, load 400mA / BYTE
- Max load per channel: 100mA
- Saturation: Max. 1.6V
- Connector: 4 x 16-pin ribbon cable connector

Physical / Environment

- Dimension: 95x90x18mm
- Temperature range: Operating: $0^{\circ}C$ to $60^{\circ}C$ at 1.5A
Storage: $-40^{\circ}C$ to $+85^{\circ}C$
- Humidity: 0 to 90% RH, non-condensing
- PC/104 Stack-through connectors (S-versions)
- Optional cable for inputs: 26-pin header to DSUB-25F, 30cm
- Optional cables for outputs: 16-pin header to DSUB-15F, 30 cm

MODEL SELECTION



EXAMPLE:

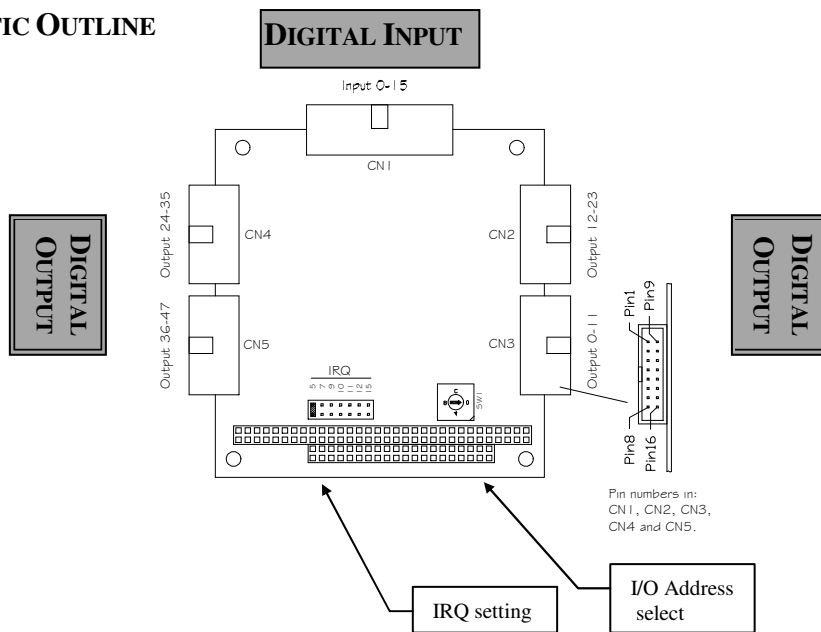
PV-1648 with PC-104 Non-Stack-through connector.
 PV-1648 - P1 - S with PC-104 Stack-through connector and 1K pull-up resistors on outputs.

PRECAUTIONS TO ESD

Please note, that the Micronix PV modules must be handled with respect to ESD (Electrostatic Discharge). Electrostatic Discharge to the PV modules must be avoided. Before removing the module from the protection bag, the user must be discharged using a grounded wrist ribbon.

INSTALLATION GUIDE

SCHEMATIC OUTLINE



SW 1	Base Address	SW1	Base Address
0	200	8	300
1	208	9	308
2	210	A	310
3	218	B	318
4	220	C	320
5	228	D	328
6	230	E	330
7	238	F	338

REGISTER FORMAT AND DESCRIPTION

The PV-1648 occupies 8 consecutive addresses of PC I/O address space. The first address or base address is determined during installation by setting the onboard rotary address switch SW1. The registers and their functions are listed in the following table (R = Read, W = write and Base = Base address).

Address	Function	Type
Base + 0	Digital Output 0-7	W
Base + 1	Digital Output 8-15	W
Base + 2	Digital Output 16-23	W
Base + 3	Digital Output 24-31	W
Base + 4	Digital Output 32-39	W
Base + 5	Digital Output 40-47	W
Base + 6	Digital Input 0-7	R
Base + 7	Digital Input 8-15	R

Software example:

```
/* Compiler: Borland C++ 3.1 */

#include <stdio.h>
#include <dos.h> /* For inportb() and outportb() */

#define BASEADDR 0x300 /* This must match with SW1 on the PV1648 */
#define OUTBYTE0 (BASEADDR+0)
#define OUTBYTE1 (BASEADDR+1)
#define OUTBYTE2 (BASEADDR+2)
#define OUTBYTE3 (BASEADDR+3)
#define OUTBYTE4 (BASEADDR+4)
#define OUTBYTE5 (BASEADDR+5)
#define INBYTE0 (BASEADDR+6)
#define INBYTE1 (BASEADDR+7)

int main (void)
{
    unsigned char value;

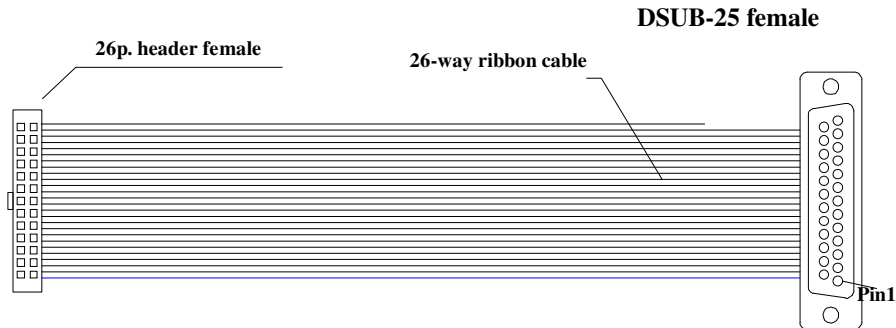
    /* Show input 0-7 */
    value = inportb (OUTBYTE0);
    printf ("Input 0 = %d\n", (value>>0) & 0x01);
    printf ("Input 1 = %d\n", (value>>1) & 0x01);
    printf ("Input 2 = %d\n", (value>>2) & 0x01);
    printf ("Input 3 = %d\n", (value>>3) & 0x01);
    printf ("Input 4 = %d\n", (value>>4) & 0x01);
    printf ("Input 5 = %d\n", (value>>5) & 0x01);
    printf ("Input 6 = %d\n", (value>>6) & 0x01);
    printf ("Input 7 = %d\n", (value>>7) & 0x01);

    /* Show input 8-15 */
    value = inportb (OUTBYTE1);
    printf ("Input 8 = %d\n", (value>>0) & 0x01);
    printf ("Input 9 = %d\n", (value>>1) & 0x01);
    printf ("Input 10 = %d\n", (value>>2) & 0x01);
    printf ("Input 11 = %d\n", (value>>3) & 0x01);
    printf ("Input 12 = %d\n", (value>>4) & 0x01);
    printf ("Input 13 = %d\n", (value>>5) & 0x01);
    printf ("Input 14 = %d\n", (value>>6) & 0x01);
    printf ("Input 15 = %d\n", (value>>7) & 0x01);

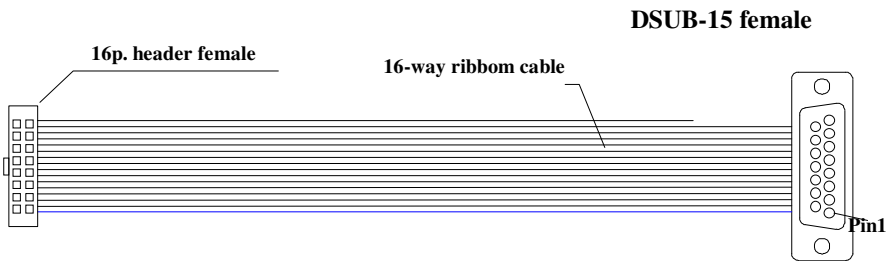
    /* Examples of output operations on D00 - D07 */
    outportb (OUTBYTE0, 0x01); /* Make /D00 active, all others off */
    outportb (OUTBYTE0, 0x02); /* Make /D01 active, all others off */
    outportb (OUTBYTE0, 0x04); /* Make /D02 active, all others off */
    outportb (OUTBYTE0, 0x08); /* Make /D03 active, all others off */
    outportb (OUTBYTE0, 0x10); /* Make /D04 active, all others off */
    outportb (OUTBYTE0, 0x20); /* Make /D05 active, all others off */
    outportb (OUTBYTE0, 0x40); /* Make /D06 active, all others off */
    outportb (OUTBYTE0, 0x80); /* Make /D07 active, all others off */
    outportb (OUTBYTE0, 0x81); /* Make /D00 & /D07 active, all others off */
    return 0;
}
```

OPTIONAL CABLES, 30CM

INPUT CABLE



OUTPUT CABLE



I/O – connector layout

DIGITAL OUTPUTS

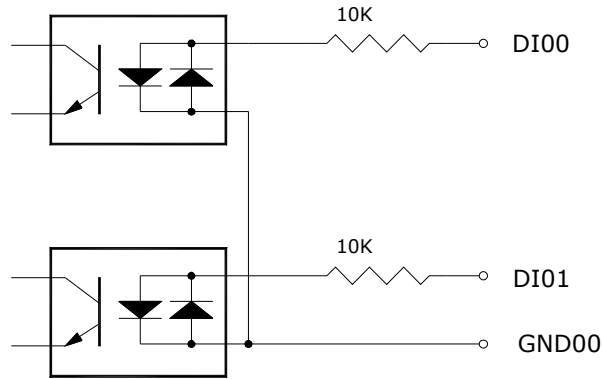
CN3 digital output 0-11		CN4 digital output 24-35	
Pin no: PV1648 & DSUB15F	Function:	Pin no:PV1648 & DSUB15F	Function:
1	Common	1	Common
9	/DO00	9	/DO24
2	/DO01	2	/DO25
10	/DO02	10	/DO26
3	/DO03	3	/DO27
11	/DO04	11	/DO28
4	/DO05	4	/DO29
12	/DO06	12	/DO30
5	/DO07	5	/DO31
13	/DO08	13	/DO32
6	/DO09	6	/DO33
14	/DO10	14	/DO34
7	/DO11	7	/DO35
8,15,(16)	Gnd	8,15,(16)	Gnd
CN2 digital output 12-23		CN5 digital output 36-47	
Pin no: PV1648 & DSUB15F	Function:	Pin no: PV1648 & DSUB15F	Function:
1	Common	1	Common
13	/DO12	13	/DO36
6	/DO13	6	/DO37
14	/DO14	14	/DO38
7	/DO15	7	/DO39
9	/DO16	9	/DO40
2	/DO17	2	/DO41
10	/DO18	10	/DO42
3	/DO19	3	/DO43
11	/DO20	11	/DO44
4	/DO21	4	/DO45
12	/DO22	12	/DO46
5	/DO23	5	/DO47
8,15,(16)	Gnd	8,15,(16)	Gnd

(16) does not appear in DSUB15F

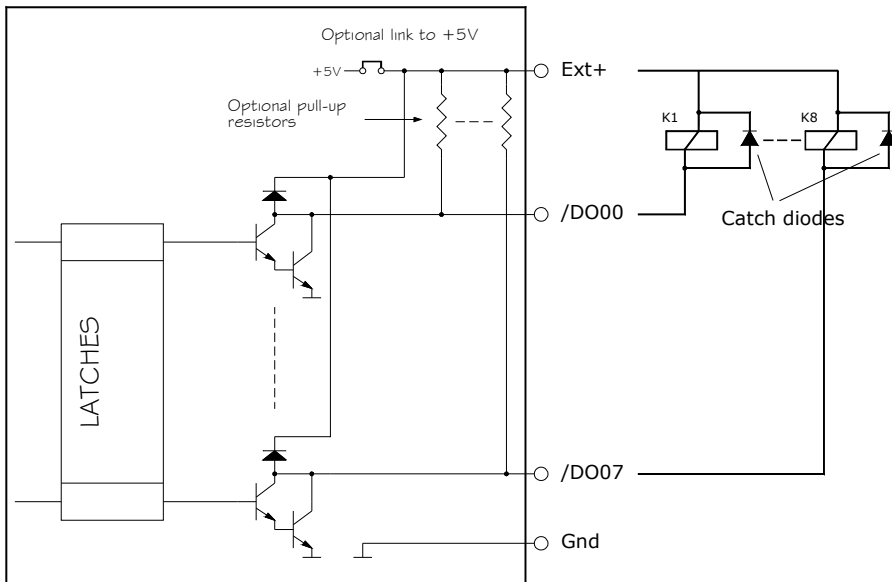
DIGITAL INPUTS

CN1 digital input 0-15			
Pin no: PV1648 & DSUB 25F	Function:	Pin no: PV1648 & DSUB 25F	Function:
1	DI00	7	DI08
2	DI01	8	DI09
14	GND00	20	GND04
15	DI02	21	DI10
16	DI03	22	DI11
3	GND01	9	GND05
4	DI04	10	DI12
5	DI05	11	DI13
17	GND02	23	GND06
18	DI06	24	DI14
19	DI07	25	DI15
6	GND03	12	GND07

INPUT CIRCUITRY SCHEMATIC



OUTPUT CIRCUITRY SCHEMATIC



When powering inductive loads, catch diodes must be connected across the loads to protect the output transistors on the PV1648 card.